

MANAGEMENT GUIDELINES ON CHILDHOOD LEAD POISONING FOR HEALTH CARE PROVIDERS

- No level of lead in the body is known to be safe.
- Primary treatment for all blood lead levels (BLLs) is prevention of lead exposure and the timely and effective reduction of any exposure that may have occurred. In addition to the long-known major sources of lead exposure (lead-contaminated paint, dust, and soil), other potential sources are being recognized. Ongoing coordination between the medical provider and the local public health team is essential for effective follow-up of lead exposed children.
- Contact the California Department of Public Health, Childhood Lead Poisoning Prevention Branch, (510) 620-5600, www.cdph.ca.gov/programs/CLPPB for more information.

Blood Lead	Pediatric Evaluation	Management
< 5 mcg/dL¹	<p>General</p> <ul style="list-style-type: none"> ▪ Standard history and physical examination and developmental assessment. ▪ Evaluate nutrition and consider iron deficiency as in all children. ▪ Evaluate lead exposure. <p>Blood Lead Levels (may be capillary or venous)²</p> <ul style="list-style-type: none"> ▪ Retest as for routine screening, i.e. obtain BLL at 1 and 2 years, test anytime up to 6 years (if not tested at 1 and 2 years), or whenever indicated by changed circumstances or identification of new risks. 	<ul style="list-style-type: none"> ▪ Comply with California regulations mandating a standard of care under which the health care provider, at each periodic health care visit from age 6 months to 72 months must give oral or written anticipatory guidance to a parent or guardian, including at a minimum that children can be harmed by lead and are particularly at risk for lead poisoning from the time they crawl until 72 months and can be harmed by deteriorating or disturbed paint and lead-contaminated dust.³ ▪ Discuss hand to mouth activity, hand washing, and sources of lead exposure (e.g. lead-contaminated paint; dust and soil, particularly near streets and roadways; lead from a household member's job, ceramic ware, cultural remedies, imported food, costume jewelry, vinyl products, and lead in plumbing and water). ▪ Counsel on any risk factors identified. ▪ Discuss test results with family. ▪ Encourage good nutrition (iron, calcium, and vitamin C); consider referral to Supplemental Nutrition Program for Women, Infants, and Children (WIC). ▪ Encourage participation in early enrichment programs for children from families with low economic and social resources and for whom exposure to lead is likely. <p>Chelation is not recommended in this BLL range.</p>
5–9 mcg/dL	<p>General</p> <p>Evaluate as above and</p> <ul style="list-style-type: none"> ▪ Consider more frequent or more extensive neurodevelopmental evaluations. <p>Blood Lead Levels (may be capillary or venous)</p> <ul style="list-style-type: none"> ▪ Consider an initial retest within 6 months.⁴ 	<p>Manage as above and</p> <ul style="list-style-type: none"> ▪ Evaluate risk to, and consider testing for, other children in the home ▪ Evaluate risk to, and consider medical referral for, other household members (especially pregnant women). ▪ Add notation on blood lead level to child's medical record for future neurodevelopmental monitoring.

Blood Lead	Pediatric Evaluation	Management
	<ul style="list-style-type: none"> ▪ If retest is in this range, consider monitoring with BLLs every 6 months until trend is downward or stable and then less often as trend indicates. ▪ If retest is in another range, follow-up as for that range. 	Chelation is not recommended in this BLL range.
10–14 mcg/dL	<p>General Evaluate as above.</p> <p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> ▪ Initially retest within 3 months. ▪ If retest is in this range, monitor with BLLs every 3 months until trend is downward or stable and then less often as trend indicates. ▪ If retest is in another range, follow-up as for that range. 	<p>Manage as above and</p> <ul style="list-style-type: none"> ▪ Advise activities such as those provided by early intervention/stimulation programs (e.g., Early Start). ▪ Consider referral to the local Childhood Lead Poisoning Prevention Program (CLPPP). The Childhood Lead Poisoning Prevention Branch (CLPPB) webpage at www.cdph.ca.gov/programs/CLPPB has links. <p>Chelation is not recommended in this BLL range.</p>
15–19 mcg/dL	<p>General Evaluate as above and</p> <ul style="list-style-type: none"> ▪ Consider Hgb/Hct. ▪ If persistent in this range evaluate as for 20-44 mcg/dL <p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> ▪ Confirm within 3 months. ▪ To determine eligibility for public health case management, retest after an interval of 30 days or more (must show persistence in this range). ▪ If confirmed in this range, monitor with BLLs every 1--3 months until trend is downward or stable and then less often as trend indicates. <p>If confirmed in another range, follow-up as for that range.</p>	<p>Manage as above and</p> <ul style="list-style-type: none"> ▪ If BLL is persistent in this range (15 mcg/dL or greater on tests done at least 30 days apart) or if BLL increases above this range, initiate referral to local CLPPP or health department for public health nurse case management, environmental investigation, and recommendations for remediation of lead sources. <p>Chelation is not recommended in this BLL range.</p>
20–44 mcg/dL	<p>General</p> <ul style="list-style-type: none"> ▪ History and physical examination with attention to neurodevelopment. ▪ Evaluate lead exposure. ▪ Evaluate nutrition. ▪ Evaluate iron deficiency: Hgb/Hct, ferritin, and Fe/TIBC are all good measures. ▪ Consider abdominal x-ray if particulate lead ingestion is suspected. 	<p>Manage as above and</p> <ul style="list-style-type: none"> ▪ Initiate referral to local CLPPP or local health department for public health nurse case management, environmental investigation, and recommendations for remediation of lead sources. ▪ Treat any iron deficiency. ▪ Order bowel decontamination if indicated. ▪ Refer to California Children Services (CCS). <p>Chelation is not typically initiated in this BLL range.</p>

Blood Lead	Pediatric Evaluation	Management
	<p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> Confirm within 1 week to 1 month (the higher the BLL, the sooner the retest). If confirmed in this range, monitor with BLLs every 2 weeks to 1 month until trend is downward or stable and then less often as trend indicates. If confirmed in another range, follow-up as for that range. 	
<p>45–59 mcg/dL</p> <p>urgent situation</p>	<p>General Evaluate as above and</p> <ul style="list-style-type: none"> Very high BLLs have been associated with renal tubular dysfunction. If potentially nephrotoxic chelating agents are to be used in treatment (e.g. CaNa₂EDTA), test renal function before and during treatment. <p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> Confirm within 48 hours If confirmed in this range, monitor with serial BLLs during any chelation. Follow-up with BLLs every 2 weeks to 1 month (or more frequently if status requires) until trend is downward or stable and then less often as trend indicates. It may be appropriate to modify protocol if BLLs remain chronically elevated, e.g. from a retained bullet. If confirmed in another range, follow-up as for that range. 	<p>URGENT MEDICAL SITUATION. Manage as above and</p> <ul style="list-style-type: none"> Consider chelation. Evaluate whether hospitalization is needed to reduce lead exposure or to achieve compliance with treatment protocols. Immediately notify local CLPPP. <p>Chelation Therapy</p> <ul style="list-style-type: none"> Consult with a provider experienced in managing chelation therapy. Order bowel decontamination before chelation, if indicated by abdominal x-ray. Consider one of two chelating agents: <ul style="list-style-type: none"> a. Succimer per outpatient prescribed protocol; give on inpatient basis if compliance or exposure reduction cannot be assured. b. CaNa₂EDTA per prescribed protocol in hospital. <ul style="list-style-type: none"> * Be certain to use only CALCIUM Na₂EDTA* Repeat treatment cycles may be needed based on blood lead rebound.
<p>60–69 mcg/dL</p> <p>urgent situation</p>	<p>General Evaluate as above.</p> <p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> Confirm within 24 hours. If confirmed in this range, monitor with serial BLLs during any chelation. Confirm within 24 hours. If confirmed in this range, monitor with serial BLLs during any chelation. 	<p>URGENT MEDICAL SITUATION. Manage as above.</p>

Blood Lead	Pediatric Evaluation	Management
	<ul style="list-style-type: none"> Follow-up with BLLs every 2 weeks to 1 month (or more frequently if status requires) until trend is downward or stable and then less often as trend indicates. It may be appropriate to modify protocol if BLLs remain chronically elevated, e.g., from a retained bullet. If confirmed in another range, follow-up as for that range. 	
<p>≥ 70 mcg/dL</p> <p>medical emergency</p>	<p>General Evaluate as above.</p> <p>Blood Lead Levels (all retests should be venous)</p> <ul style="list-style-type: none"> Confirm any BLL in this range immediately. If confirmed in this range, monitor with serial BLLs during chelation. Follow-up with BLLs every 2 weeks to 1 month (or more frequently if status requires) until trend is downward or stable and then less often as trend indicates. It may be appropriate to modify protocol if BLLs remain chronically elevated, e.g. from a retained bullet. If confirmed in another range, follow-up as for that range. 	<p>MEDICAL EMERGENCY. Manage as above and</p> <ul style="list-style-type: none"> Immediately hospitalize to stabilize, reduce lead exposure, chelate, and monitor progress. Immediately notify local CLPPP. <p>Chelation Therapy</p> <ul style="list-style-type: none"> Consult with a provider experienced in managing chelation therapy. Order bowel decontamination before chelation, if indicated by abdominal x-ray. Typically combined therapy with BAL (dimercaprol) and CaNa₂EDTA per prescribed protocol. <ul style="list-style-type: none"> * Be certain to use only CALCIUM Na₂EDTA* * Assess for peanut allergy if using BAL (BAL is suspended in peanut oil)* Repeat treatment cycles may be needed based on blood lead rebound.

Note: Searching for gingival lead lines; testing of neurophysiologic function specifically for lead (postural sway, auditory evoked potentials, or nerve conduction); testing of hair, teeth, fingernails, or urine for lead; radiographic imaging of long bones; and X-ray fluorescence of long bones are not usually recommended.⁵

- Blood lead test results should be rounded to the nearest whole number, with numbers with decimals equal to and above 0.5 rounded up and numbers with decimals below 0.5 rounded down; e.g. treat 4.5 mcg/dL as 5 mcg/dL, 9.5 mcg/dL as 10 mcg/dL, 14.5 mcg/dL as 15 mcg/dL, 4.3 mcg/dL as 4 mcg/dL.
- Capillary specimens for lead are easily contaminated. Capillary specimens are acceptable for screening but all retests on BLLs ≥ 10 mcg/dL should be on venous blood. When a reference is made to a "venous" specimen, arterial or umbilical line specimens may be substituted. Use of a heelstick instead of a fingerstick to obtain a capillary specimen is recommended in children under one year of age.
- California Code of Regulations, Title 17, Sections 37000–37100.
- Consider retesting in six months, particularly if the BLL is approaching 10 mcg/dL and the child is less than two years of age, is at high risk for lead exposure, or was tested at the start of warm weather (when BLLs tend to increase).
- CDC: *Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention* U.S. Department of Health and Human Services, March 2002; http://www.cdc.gov/nceh/lead/CaseManagement/caseManage_main.htm.